

np Charge Exchange Polarimetry in GeV Region

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Abstract

Analyzing powers for polarized neutrons exist only for thin hydrogen targets. Cross section and analyzing powers for np, for both elastic and charge exchange are known up to 29 GeV/c. No data are known to exist for thick analyzers, made of scintillator material. A scintillator polarimeter target is required to make a coincidence trigger for both reactions. The recoil proton of elastic scattering gives a scintillator signal, and the forward neutron goes to the hadron calorimeter. For charge exchange, the forward particle is a proton, and the recoil neutron gives a signal in the scintillator target. A measurement of the angular dependence of A_y for the neutron, both elastic and charge exchange, on CH and up to 4.5 GeV/c, is essential to the continuation of neutron form factor measurements to the highest possible Q^2 at JLab.

Data on cross section and analyzing power for charge exchange and elastic np scattering are collected. Predictions are done on the Figure of Merit for these two reactions.

The results of testing the experimental setup ALPOM2 on neutron and proton beams are presented. The measurements of analyzing powers will be done in the end of this year.